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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/802,280	03/08/2001	Michael R. Franceschini	RTN-098AUS	6871

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RAYTHEON COMPANY  
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354A TURNPIKE STREET  
SUITE 301A  
CANTON, MA 02021

EXAMINER
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CORRIELUS, JEAN B

ART UNIT	PAPER NUMBER
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2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/05/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

09/802,280

Applicant(s)

FRANCESCHINI ET AL.

Examiner

Jean B Corrielus

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5, 10 and 12-15 is/are pending in the application.
- 4a) Of the above claim(s)    is/are withdrawn from consideration.
- 5) ☐ Claim(s)    is/are allowed.
- 6) ☒ Claim(s) 1-5, 10 and 12-15 is/are rejected.
- 7) ☐ Claim(s)    is/are objected to.
- 8) ☐ Claim(s)    are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on    is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No.   .
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date   .
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date   .
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other:   .

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/11/07 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jalali 6,421,333 in view of Brajal et al US Patent No. 5,548,582.

As per claim 1, Jalali et al discloses spread spectrum RF communication system fig. 1 comprising a convolutional encoder (note that the convolutional encoder is a type of FEC encoder) to encode digital data to provide a plurality of symbol blocks see col. 2., lines 61-67 (note that at col. 2, lines 61-65 that Jalali teaches that each bit is encoded to generate "m symbols", the "m symbols" is considered as the claimed

"symbol blocks") each of the plurality of symbol block includes a plurality of symbols; an interleaver and multiplexer 16 and 16a configure to map each symbol of one of the plurality of symbol blocks into a different one of the plurality of carriers (subbands) see col. 3, lines 19-24; a Wash subband encoder 18.1-18.n to encode each symbol within each one of the plurality of carriers (coherent subbands). Fig. 1 and fig. 2, Jalali teaches that a plurality of carriers  $f_1$ -  $f_n$  (subbands) are used hence, a carrier generator or exciter is inherently provided by Jalali. However, Jalali does not teach the additional limitation of performing an IFFT on each one of the carriers (subbands) symbols. Brajal et al teaches the additional limitation of performing an IFFT using device 15 of fig. 2 on each one of the carriers (subbands) symbols. Given that fact, it would have been obvious to one skill in the art to incorporate such a teaching in Jalali in order to facilitate the transmission of the signal in time domain. In addition, such modification would have provided compatibility with existing receiver set to receive signal only in the time domain.

As per claim 2, as applied to claim 1 above, Jalali discloses every feature of the claimed invention but does not explicitly teach that the FEC encoder is a Reed Solomon encoder. However, implementing a FEC encoder as a Reed Solomon encoder is old and well known in the art. Given that fact, it would have been obvious to one skill in the art to implement the FEC encoder as Reed Solomon encoder in order as to take advantage of its enhance technological feature such as correction of up to a series of number of errors in a N symbol codeword.

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As per claim 3, it would have been obvious to one skill in the art to implement the FEC encoder as a Turbo code in order as to take advantage of its enhance technological feature such as such as low probability of having low weight codewords.

As per claim 4, the FEC encoder is a convolutional encoder. See fig. 1.

As per claim 5, Jalali further teaches a transmission security device 20.1-20.n to encrypt each one of the Walsh encoded symbol sets.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jalali in view of Huang et al US Patent No. 6,519,731 and further in view of Brajal et al US Patent No. 5,548,582.

Jalali et al discloses spread spectrum RF communication system and method (fig. 1) comprising a convolutionally encoding a digital data using encoder 12 to provide a plurality of code symbols (symbol groups) see col. 2, lines 61-65 (note that at col. 2, lines 61-65 that Jalali teaches that each bit is encoded to generate "m symbols", the "m symbols" is considered as the claimed "symbol blocks") each of the plurality of symbol block includes a plurality of symbols; an interleaver (16 and 16a) to map each one of the plurality of symbols groups across a plurality of carriers (coherent subbands) each symbol is mapped to a different one of the plurality of carriers (coherent subbands) see col. 3, lines 19-24; a Walsh subband encoder 18.1-18.n to encode each symbol within each one of the plurality of subbands with walsh code. However, Jalali does not teach or fairly suggest that the further steps of forming data stream includes a plurality of packets and embedding each data packet into a physical layer by adding a header, and

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CRC information to each packet. It also fails to teach that the Walsh code is a low rate Walsh code. In addition, it fails to teach the FEC encoder is a Reed Solomon and performing an IFFT on each one of the carriers (subbands) symbols. However, packetizing a data information and adding a header and CRC information to each packet are old and well known in the art. For instance, Huang et al discloses, fig. 2 the further limitations of packetizing a data information and adding a header and CRC information to each packet see fig. 2 and col. 3, lines 27-45. Given that fact, it would have been obvious to one skill in the art to incorporate such a teaching in Jalali in order to ensure that data is sent in block rather than a bit by bit basis so as to enhance transmission time in addition the occurrence of error in the received would have been kept at minimum. In addition, it would have been obvious to one skill in the art to use low rate Walsh code in order to be able to low rate signal such as voice signal. In addition, it would have been obvious to one skill in the art to implement the FEC encoder as Reed Solomon encoder in order as to take advantage of its enhance technological feature such as correction of up to a series of number of errors in a N symbol codeword. Furthermore, Brajal et al teaches the additional limitation of performing an IFFT using device 15 of fig. 2 on each one of the carriers (subbands) symbols. Given that fact, it would have been obvious to one skill in the art to incorporate such a teaching in Jalali and Huang in order to facilitate the transmission of the signal in time domain. In addition, such modification would have provided compatibility with existing receiver set to receive signal only in the time domain.

5. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jalali 6,421,333 in view of Brajal et al US Patent No. 5,548,582 and further in view of Roberts US Patent No. 6,577,670.

As per claim 13, Jalali et al discloses spread spectrum RF communication system fig. 1 comprising a convolutional encoder (note that the convolutional encoder is a type of FEC encoder) to encode digital data to provide a plurality of symbol blocks see col. 2., lines 61-67 (note that at col. 2, lines 61-65 that Jalali teaches that each bit is encoded to generate "m symbols", the "m symbols" is considered as the claimed "symbol blocks") each of the plurality of symbol block includes a plurality of symbols; an interleaver and multiplexer 16 and 16a configure to map each symbol of one of the plurality of symbol blocks into a different one of the plurality of carriers (subbands) see col. 3, lines 19-24; a Wash subband encoder 18.1-18.n to encode each symbol within each one of the plurality of carriers (coherent subbands). Fig. 1 and fig. 2, Jalali teaches that a plurality of carriers  $f_1 - f_n$  (subbands) are used hence, a carrier generator or exciter is inherently provided by Jalali. However, Jalali does not teach the additional limitation of performing an IFFT on each one of the carriers (subbands) symbols. It also fails to teach that the encoder is a RS-encoder and a subband filter to excise a frequency subband to prevent interference. Brajal et al teaches the additional limitation of performing an IFFT using device 15 of fig. 2 on each one of the carriers (subbands) symbols. Given that fact, it would have been obvious to one skill in the art to incorporate such a teaching in Jalali in order to facilitate the transmission of the signal in time

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domain. In addition, such modification would have provided compatibility with existing receiver set to receive signal only in the time domain. In addition, implementing a FEC encoder as a Reed Solomon encoder is old and well known in the art. Given that fact, it would have been obvious to one skill in the art to implement the FEC encoder as Reed Solomon encoder in order as to take advantage of its enhance technological feature such as correction of up to a series of number of errors in a N symbol codeword.

As per claim 12, Jalali discloses a security device (20) coupled to Walsh encoder 18 note that with the inclusion of Brajal, the security device will be coupled to the IFFT).

6. Claim 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jalali 6,421,333 in view of Brajal et al US Patent No. 5,548,582 further in view of Roberts US Patent No. 6,577,670 and further in view of Rakib et al US patent No. 6,426,983.

As per claim 14, applied to claim 13 above, Jalali, Brajal and Roberts, Jalali and Roberts teach every feature of the claimed invention but do not explicitly teach that a corresponding subband filter is used in the receiver to excise a frequency subband as in the transmitter. Rakid teaches a subband filter at the receiver to excise (erase) bin (subband) infected by interfering signal see summary of the invention. Given that, it would have been obvious to one skill in the art to modify Jalali, Brajal and Roberts by inserting a corresponding subband filter in the receiver in order to remove interference signal so as to improve signal detection.

As per claim 15, it would have been obvious to one skill in the art to select a different mapping in the receiver and the transmitter that avoid mapping symbols into excised subbands because if data were allowed to be mapped in the excised channel (subband) see for instance the spectrum fig. 4 of Roberts signal lost would have resulted since the signal would have been included in a removed or non-existent subband.

### ***Response to Arguments***


7. Applicant's arguments filed 1/11/07 have been fully considered but they are not persuasive. It is alleged that Jalali does not teach segregating the plurality of carriers into a plurality of subbands and transmitting the coded symbols on a different subband. However it is noted that the claimed "subbands" are generally known as "carriers". See for instance US patent publication No. 2005/02763348, paragraph 0085. In addition, note that Jalali col. 1, line 31 that teaches a multicarrier frequency of  $n \cdot 1.25$  MHz subdivided into frequencies/channels/carriers  $f_1$ - $f_n$ , see col. 2, lines 51-52. Hence the bandwidth of the multicarrier system is segregated into plurality of channels or bin or carriers (subbands). Applicant argues that "the present invention does not map each symbol into sequential carriers as taught by Jalali, but maps each symbol into a different subband of carriers such that the symbols are not on sequential carriers". However, it is noted that Jalali, per fig.1 shows that the carriers are not in sequential rather parallel. Hence the symbols are map in Jalali in each of different carrier (subband) so that the symbols are transmitted in parallel. (see fig. 1).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B. Corrielus whose telephone number is 571-272-3020.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jean B Corrielus  
Primary Examiner  
Art Unit 2611

2-1-07